# Table of Contents

## PART A – STANDARD DRAWINGS

### Section I – Pipeline Construction

- P-1  Typical Utility Location for new construction
- P-2  Pipeline Separation Requirements
- P-3  Water Pipe Bedding and Trench Backfill
- P-4  Trench Repaving
- P-5  List of Cities/Counties with Repaving Requirements
- P-6  Cutting and Plugging Water Mains
- P-7  Trench Plates
- P-8  6-inch Standard Wet Barrel Fire Hydrant
- P-9  6-inch Standard Dry Barrel Fire Hydrant
- P-10  4-inch Flushout – Type 1
- P-11  4-inch Blow-off Assembly
- P-12  6-inch Blow-off Assembly
- P-13  Sampling Station
- P-14  1-inch Combination Air Release and Vacuum Relief Valve
- P-15  2-inch Combination Air Release and Vacuum Relief Valve
- P-16  1-inch Compact Style Combination Air Release and Vacuum Relief Valve
- P-17  2-inch Compact Style Combination Air Release and Vacuum Relief Valve
- P-18  Standard Thrust Block
- P-19  Restraint of Joints for Ductile Iron and PVC Pipe at Tee Connection
- P-20  Restraint of Joints for Ductile Iron and PVC Pipe at 90-degree Vertical or Horizontal Bend
- P-21  Restraint of Joints for Ductile Iron and PVC Pipe at a Dead End or Each Side of Valve
- P-22  Casing for Water Mains
- P-23  Tapping Sleeve and Valve
- P-24  Cut-in Tee
- P-25  Water Service Construction Notes
- P-26  1-inch Water Service Connection
- P-27  2-inch Water Service Connection
- P-28  Typical Meter Box Location
- P-29  1-inch Grouped Domestic Service Connection
- P-30  Large Meter with Bypass (3-inch to 12-inch Meter)
- P-31  Valve Box – Type 1
- P-32  Valve Box – Type 3
- P-33  Normally Closed Valve Can
- P-34  Pressure Regulating Station (with low flow pressure control valve)
- P-35  Backflow Prevention Assembly - Overview for Above Ground Installation
- P-36  Utility Vault Installation
- P-37  Sealing Pipe Opening thru Vault
- P-38  Insulating Flange Kit Materials
- P-39  90-degree Welded Steel Utility Invert
- P-40  90-degree Mechanical Joint D.I.P. Utility Invert
- P-41  45-degree Welded Steel Utility Invert
- P-42  45-degree Mechanical Joint D.I.P. Utility Invert
- P-43  Valve Anchor
Section II – Civil and Site Work

C-1 Curb Drain Box
C-2 Adjustable Pipe Support
C-3 Reinforced Concrete Block Wall
C-4 Steel Tube Fence and Gate
C-5 Typical Site Paving
C-6 Concrete Alley Gutter
C-7 Concrete Curb and Curb & Gutter
C-8 Project Information Sign
C-9 Vehicle Barricade
C-10 Typical Fire Hydrant Location
C-11 Blue Pavement Markers for Fire Hydrants
C-12 Paving Around Valves (Not in the Pavement)
C-13 Pipeline Marker Post Installation
C-14 Pole Mounted Light
C-15 Rumble Pad Construction Entrance-Exit (TC-1B)
C-16 Erosion Control Fiber Roll Installation (SC-5)
C-17 Concrete Headwall
C-18 Injection Point/Sample Port Protective Cage
C-19 Local Drainage Structure

PART B – FACILITY DESIGN DRAWINGS

Section III – Pump Stations

PS-1 Typical Booster Pump Station Site Plan and Dimensions
PS-2 Standard Pump Station Floor Plan and Piping Plan/Foundation and Roof Framing
PS-3 Typical Pump Station Building and Piping Sections
PS-4 Footing and Foundation Details/ Typical Horizontal & Vertical Lap Splice Reinforcement Details
PS-5 Sill Bolt, Hold Down Anchor and Ledger Splice Details
PS-6 Wall Intersection and Double Joist Nailing
PS-7 Force Transfer Around Wall Opening
PS-8 Plywood Shear Wall Construction
PS-9 Strap Across Opening and Scab Stud Over Bolt
PS-10 Top Plate Splice
PS-11 Horizontal Roof Diaphragm Nailing
PS-12 Roof Framing Details
PS-13 Architectural Views of Pump Building
PS-14 Pump Station Air Flow Schematic
PS-15 Skylight and Enclosure
Section IV – Wells

W-1 Water Well Destruction
W-2 Typical Well Site Plan and Dimensions
W-3 Typical Well Construction Cross Section
W-4 Well Pump Base and Pump Connection
W-5 Well Discharge Pipe and Flush Pipe
W-6 Water Quality Sampling and Air Release & Vacuum Valve Assembly
W-7 Pressure Gage and Water Quality Sampling Port
W-8 Chemical Injection Quill and Hose Bib
W-9 Emergency Eye Wash and Shower/Chemical Building Work Table and Analyzers
W-10 Movable Well Building (Up to 200 hp Motor)
W-11 Movable Well Building (250 hp Motor and larger)
W-12 Subbase and Soils Preparation
W-13 Acoustic Well Pump Enclosure
W-14 Floor/Roof Plan and Architectural Views of Disinfection Building – 2 Bay
W-15 Floor/Roof Plan and Architectural Views of Disinfection Building – 3 Bay
W-16 Floor/Roof Plan and Architectural Views of Disinfection Building – 4 Bay
W-17 Floor/Roof Plan and Architectural Views of Disinfection Building – 1 Bay
W-18 Floor/Roof Plan and Architectural Views of Fluoride Injection Building
W-19 Structural Details
W-20 Chemical Building Door and Louver Details
W-21 Chemical Building Signage
W-22 Well Pump Building with Removable Roof and Walls
W-23 Architectural Views of Well Building with Removable Roof

Section V – Water Tanks

T-1 Welded Steel Reservoir Typical Site Plan and Section View
T-2 Inlet Connection
T-3 Outlet Connection
T-4 Overflow Pipe
T-5 Large Access Manway with Cleanout
T-6 Overflow/Cleanout Catch Basin and Support Bracket
T-7 36-inch Access Way and Section
T-8 Stairway and Anti-Climb Cage
T-9 Tank Roof Working Area
T-10 Roof Hatch and Interior Ladder
T-11 Interior Ladder Safety Post
T-12 Sealed Flanged Roof Hatch
T-13 Center Roof Vent
T-14 Tank Roof CP Hand Hole Cover
T-15 Reservoir Subdrain Plan
T-16 Water Sampling Connection and Sensing Line Connection/Tank Multiple Sample Ports
T-17 Half Height Water Level Indicator
T-18 Altitude Valve and Vault
T-19 Example of Typical Tank Survey Appurtenance Locations
Part A – Standard Drawings
NOTES:

1. Location and depth of existing and proposed utilities must be provided by the developer and shown on any plans submitted to the City/County Public Works Department for approval.

2. Changes may be permitted by GSWC in cases of conflicting facilities.

3. For commercial sidewalks, the fire hydrant shall be placed 18" behind sidewalk. Hydrants shall not be located in sidewalks.

4. Materials shall be selected from the accepted materials guideline.

5. Distance from curb face to water main is 4' min for 8" pipe and 5' min for 12" or larger pipe in residential/commercial developments in streets up to 40' curb to curb. Distance can be 7' in major streets greater than 40' wide.

ITEM | DESCRIPTION
--- | ---
1 | Fire hydrant, locate in accordance with GSWC Std. Dwg. No. C-10
2 | Joint utilities trench
3 | Valve box
4 | Street lighting conduit in trench
5 | Street light base
6 | Domestic water main
7 | Reclaimed water main (where required)
8 | Storm drain
9 | Sewer main
10 | Gas main
ZONE SPECIAL SEWER CONSTRUCTION REQUIREMENTS

ZONE A

No construction of new water mains in this zone without written approval from DDW.

ZONE B

New water main in this zone shall be constructed of Special Pipe Materials, (see Section VI).

ZONE C

No joints in water main – Special Water Pipe, (see Section III).

ZONE D

No joints in water main, (see Section III).

ZONE P

Construction prohibited in this area.
GENERAL NOTES:

1) Application of this standard drawing must comply with Section 64572, Title 22, California Code of Regulations, latest revision.

2) If the condition of the existing sewer cannot be readily determined, the alternative construction requirements for water mains described below shall apply depending on if the crossing is perpendicular or parallel.

3) A “sewer line” is defined as a pipeline conveying non–potable water or hazardous liquids including but not limited to recycled water, sewage and fuels.

4) All exceptions to these minimum separation standards must be reviewed by the Division of Drinking Water (DDW) and a written waiver obtained prior to construction of the crossing. This applies to any construction in Zones A, B, C or D.

I. Separation Standards per Division of Drinking Water Requirements (DDW)

a. The Minimum Separation Requirements Between Water Mains And Non–Potable Pipelines As Contained In Section 64572, Title 22, California Code Of Regulations

   i. Parallel Construction Requirements:

      1. Sewer Lines: Water mains shall be at least 10 feet clear horizontal distance from sewer lines and 1 foot clear vertical distance above sewer lines.

      2. Storm Drain Or Recycled Water Pipelines: Water mains shall be at least 4 feet clear horizontal and 1 foot clear vertical distance above storm drain or recycled water pipelines.

   ii. Crossing Construction Requirements: When pipelines must cross, potable water mains shall be at least 1 foot clear above non–potable pipelines and as close to perpendicular as possible.

   iii. Separation distances as specified shall be measured from the nearest outside edge of each pipeline; i.e. the clear distance.

   iv. Water mains and sewer lines must not be installed in the same common trench.

   v. New water mains shall not be installed within 100 horizontal feet of the nearest edge of any sanitary landfill, wastewater disposal pond or hazardous waste disposal site or within 25 horizontal feet of the nearest edge of any cesspool, septic tank, sewage leach field, seepage pit, underground hazardous material storage tank or groundwater recharge project site without written approval of the Department of Drinking Water.

b. Exceptions to Basic Separation Standards

   i. Local conditions may create a situation where there is no alternative but to install water mains at a distance less than that required by the Basic Separation Standards above. In such cases alternative construction criteria as shown below should be followed.

   ii. Sewer mains of 24 inches in diameter or larger may create special hazards because of the large volumes of flow from a pipeline break. Therefore installations of water mains in the vicinity of sewer mains 24 inches in diameter or larger must be reviewed on a case–by–case basis by DDW to determine if the separation and protection measures are adequate.
GENERAL NOTES CONTINUED:

II. Construction of Water Lines Parallel to Sewer and Storm Drain Lines
   a. See Fig. 1A and 1B
      i. Zone “A” – no construction of new water mains in this zone without written approval from DDW.
      ii. Zone “B” – new water mains in this zone shall be constructed of Special Pipe Materials (see Section VI). Joints shall be restrained.

III. Construction of Water Lines Crossing Sewer and Storm Drain Lines
   a. See Figure 2
      i. Zone “C” – the new water main in this zone shall have no joints in this zone unless they are restrained and shall be constructed of Special Pipe Material. Water main inverts under existing sewer or storm drain pipes shall be constructed as shown on GSWC Standard Drawing P–39, P–40, P–41 or P–42.
      ii. Zone “D” – the new water main in this zone shall have no joints unless they are restrained. Valves and fitting shall be flanged or MEGALUG. Center the new pipe section over the utility being crossed.

IV. Crossings of a Sewer Force Main
   a. In addition to other sewer requirements, when a new water main crosses over an existing sewer force main the water main shall be constructed of pipe materials with a minimum rated working pressure of 200 psi.
   b. No water main shall cross under a sewer force main.

V. Crossings of Gravity Sewer Laterals
   a. Special construction criteria, as defined above, shall apply to sewer laterals that cross above a potable water main but not to sewer laterals that cross below a potable water main.

VI. Definition of Special Pipe Material
   a. Ductile iron pipe (Class 350) with bitumastic coating (AWWA C151), or
   b. Welded steel pipe, CML & wrapped or CML&C rated at 200 psi or greater, or
   c. PVC water pipe (Class 200) (AWWA C–900) or equivalent, or
   d. Reinforced Concrete Pressure Pipe, Steel Cylinder Pipe, 200 psi minimum, (AWWA C300, C301 or C303, latest revisions), or
   e. HDPE pipe with fusion welded joints, (DR–18, 200 psi minimum) (AWWA C906)
NOTES:
1. Trench and pavement per City/County permit requirements or as noted on the drawing and Std. Dwg. P–4.
2. Compaction of backfill per specifications.
3. Pipe base shall be 12” thick where native material has rocks larger than 6 inches in trench bottom.
4. Contractor shall hand excavate “bell hole” for each pipe joint so that the weight of the pipe does not rest on the bell. Contractor to refill and hand-tamp each “bell hole” prior to completing the placement of the bedding.
5. For areas where native soil contains cobbles and large stones (such as Rancho Cordova), place geotechnical filter fabric between Pipe Zone and Trench Zone backfill to prevent migration of rocks to the pipe.
7. Table shows gradation requirements for SE–30 backfill.
1. For specific repaving requirements see permit from City/County.

2. Contractor to clean surfaces that are adjacent new paving and remove rocks, dirt, old paving and/or old concrete that would prevent pavement compaction equipment from keeping contact with the new paving and prevent proper compaction of the new pavement.

3. Temporary paving shall be min. 2-inches thick and installed over a trench zone section that is level and square.

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NOTE:
1. GSWC Standard for Trench Repaving Detail shall be used except where City/County repaving requirements are greater or as required by the encroachment permit.
NOTES:
1. Bearing area against undisturbed soil shall be the same as for dead ends.
2. When called out on plans, install blow-off.
3. Thrust blocks shall be class 560–C–3250 concrete, unless otherwise specified.
4. All buried bolts shall be coated with "Devwrap 142S".

REMOVE EXIST. TEE
COMMON WHEN ABANDONING MAINS IN ALLEYWAYS & BACKYARD EASEMENTS
NOTES:
1. Use of trench plates shall meet the current requirements of the City/County jurisdiction where the work is being done.


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3. For spans greater than 63" a structural design shall be prepared by a California registered civil engineer.

4. All steel plates used in or out of the traveled way shall be without deformation. The GSWC representative shall determine the trueness of the steel plate by using a straight edge and will reject any plate that is permanently deformed.

5. Steel plates used in the traveled portion of the right of way shall have a surface that was manufactured with a nominal Coefficient of Friction (COF) of 0.35. The contractor shall determine what amount of surface wear is acceptable, and independently ascertain when to remove, test, or resurface an individual steel plate.

6. Contractor shall not install any steel plate that is permanently deformed or delivered without the required surfacing.

7. A warning sign meeting Caltrans standards shall be placed in advance of steel plate bridging. This sign shall be used with all other required construction signing.
NOTES:

1. On roads without curbs, fire hydrants shall be located within the road right of way, one foot clear from the property line unless otherwise indicated on the plans.

2. Hydrants & risers are to be painted per local fire department requirements and a blue reflective marker installed on the pavement per Std. Dwg. No. C-11.

3. C-900 pipe shall be used when the main line is PVC.

4. In LA County, valves shall be 10' – 25' from hydrant. Install 2 valves if distance from main is greater than 25'.

5. Fire hydrants shall be located per GSWC Std. Dwg. No. C-10.
NOTES:

1. On roads without curbs, fire hydrants shall be located within the road right of way, one foot clear from the property line unless otherwise indicated on the plans.

2. Hydrants & risers are to be painted per local fire department requirements and a blue reflective marker installed on the pavement per Std. Dwg. No. C–11.

3. In Wrightwood District, cover over main shall be 42" from top of pavement, use hydrant with minimum 54" bury length.

4. Adequate clearance between thrust block and drain hole shall be provided to assure proper drainage.

5. C–900 pipe shall be used when the main line is PVC.

6. In LA County, valves shall be 10' – 25' from hydrant. Install 2 valves if distance from main is greater than 25'.

NOTES:

1. C–900 pipe shall be used where main installation is PVC.

2. Coating materials shall be per GSWC painting specifications for above grade piping.


4. Flush outs shall be located similar to GSWC Std Dwg No. C–10 for fire hydrants.
NOTES:

1. On mains 12" and larger, install a 12" long flanged spool between 90' bend and gate valve.

2. C-900 pipe shall be used when the main line is PVC.

3. Coating materials shall be per GSWC painting specifications for above grade piping.

4. D.I.P. shall be cement lined and bitumastic coated.

5. Fire hydrants shall be located per GSWC Std. Dwg. No. C-10.
NOTES:
1. Restrained joints are required.

2. Blow-off (hydrant body) to be painted "Safety Yellow" for potable water.

3. Blow-off shall be located similar to GSWC Std. Dwg. No. C-10 for fire hydrants.

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<td>1</td>
<td>#10 copper tracer wire taped to pipe</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
NOTES:

1. No sampling stations shall be installed beyond limits of public right of way without easements.

2. Door shall open to side opposite vehicular traffic.

3. Sampling stations shall be located similar to GSWC Std. Dwg. No. C-10 for Fire Hydrants.

4. Stainless steel materials to be electrically insulated from D.I.P. or copper materials.
NOTES:
1. Maintain positive slope from main to air release valve.
2. Slip-on or copper fittings with silver solder brazing shall be used in lieu of copper pack joints.
3. Air valve assembly shall be located similar to GSWC Std. Dwg. No. C–10 for fire hydrants.
4. As an alternative the enclosure can be 12" dia. x 24" high.
NOTES:
1. Maintain positive slope from main to air release valve.
2. Slip-on or copper fittings with silver solder brazing shall be used in lieu of copper pack joints.
3. Air valve assembly shall be located similar to GSWC Std. Dwg. No. C-10 for fire hydrants.
NOTES:
1. Maintain positive slope from main to air release valve.
2. Slip-on or copper fittings with silver solder brazing shall be used in lieu of copper pack joints.
3. Air valve assembly shall be located similar to GSWC Std. Dwg. No. C-10 for fire hydrants.
4. A foam insulator shall be used around A/V valve body, in areas where there are freezing conditions. See potable water materials guideline.
5. As an alternative, the enclosure can be 12" dia. x 24" high.
NOTES:
1. Maintain positive slope from main to air release valve.
2. Slip-on or copper fittings with silver solder brazing shall be used in lieu of copper pack joints.
3. Air valve assembly shall be located similar to GSWC Std. Dwg. No. C-10 for fire hydrants.
4. A foam insulator shall be used around A/V valve body, in areas where there are freezing conditions. See potable water materials guideline.
5. As an alternative, the enclosure can be 12" dia. x 24" high.
NOTES:

1. All buried bolts shall be coated with "Bitumastic No. 50" or approved equal.
2. Thrust block areas based on 225 PSI pressure and 2,000 PSF allowable soil pressure with 2½ feet of cover minimum. Additional bearing area required for special conditions shall be approved by the district engineer.
3. Thrust block bearing faces shall be placed against undisturbed soil, approved compacted backfill or class 100–E–100 slurry.
4. Thrust blocks shall be 560–C–3250 concrete, unless specified otherwise.
   A. Install 3/8" bend rod handles.
   B. Use cardboard separators between blocks, if needed.

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>DESCRIPTION</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot;</td>
<td></td>
<td>3.1</td>
<td>4.3</td>
<td>3.1</td>
<td>2 @ 3.1</td>
<td>2 @ 3.1</td>
<td>4 @ 1.2</td>
<td>2.3</td>
<td>2 @ 1.2</td>
<td>8.0</td>
<td></td>
</tr>
<tr>
<td>6&quot;</td>
<td></td>
<td>6.3</td>
<td>8.9</td>
<td>6.3</td>
<td>2 @ 6.3</td>
<td>2 @ 6.3</td>
<td>4 @ 2.5</td>
<td>4.8</td>
<td>2 @ 2.5</td>
<td>9.0</td>
<td></td>
</tr>
<tr>
<td>8&quot;</td>
<td></td>
<td>10.9</td>
<td>15.4</td>
<td>10.9</td>
<td>2 @10.9</td>
<td>2 @ 10.9</td>
<td>4 @ 4.2</td>
<td>8.3</td>
<td>2 @ 4.2</td>
<td>10.1</td>
<td></td>
</tr>
<tr>
<td>10&quot;</td>
<td></td>
<td>16.3</td>
<td>28.1</td>
<td>16.3</td>
<td>2 @16.3</td>
<td>2 @ 16.3</td>
<td>4 @ 6.4</td>
<td>12.5</td>
<td>2 @ 6.4</td>
<td>11.3</td>
<td></td>
</tr>
<tr>
<td>12&quot;</td>
<td></td>
<td>23.1</td>
<td>32.7</td>
<td>23.1</td>
<td>2 @ 23.1</td>
<td>2 @ 23.1</td>
<td>4 @ 9.0</td>
<td>17.7</td>
<td>2 @ 9.0</td>
<td>12.5</td>
<td></td>
</tr>
<tr>
<td>14&quot;</td>
<td></td>
<td>31.0</td>
<td>43.9</td>
<td>31.0</td>
<td>2 @ 31.0</td>
<td>2 @ 31.0</td>
<td>4 @ 12.1</td>
<td>23.8</td>
<td>2 @ 12.1</td>
<td>13.8</td>
<td></td>
</tr>
<tr>
<td>16&quot;</td>
<td></td>
<td>40.1</td>
<td>56.7</td>
<td>40.1</td>
<td>2 @ 40.1</td>
<td>2 @ 40.1</td>
<td>4 @ 15.7</td>
<td>30.7</td>
<td>2 @ 15.7</td>
<td>15.1</td>
<td></td>
</tr>
</tbody>
</table>
NOTES:

1. "X" and "Y" shall be determined by length values using the DIPRA design method if conditions differ from assumptions given on Std. Dwg. No. P-21.

2. If actual conditions differ from those listed above or the required restrained length cannot be met, the restrained length shall be determined by the design engineer and concurred with the district engineer.
VERTICAL BEND

HORIZONTAL BEND

VERTICAL BEND

NOTES:
1. If actual conditions differ from those listed above or the required restrained length cannot be met, the restrained length shall be determined by the design engineer and concurred with the district engineer.
DEAD END

NOTES:
(Use for Std. Dwg. No. P-19, P-20, & P-21)

1. All joint within length “L” shall be restrained.

2. Assumed Depth of cover for 8” pipe or less to be 3.5’ min. (42”); 16” pipe or greater to be 4.0’ min. (48”).

3. Assumptions for determining length shown:
   - Test pressure: 225 psi
   - Type 4 laying conditions
   - A safety factor of 2
   - Sand/silt soil conditions
   - Polyethylene wrap

4. Length calculated using DIPRA restrained joint program.

5. If actual conditions differ from those listed above or the required restrained length cannot be met, the restrained length shall be determined by the design engineer and concurred with the district engineer.
NOTES:

1. For PVC carrier pipe, use polyethylene casing insulators with polyethylene skids.

2. For ductile iron carrier pipe, use stainless steel band spacers and insulators with glass filled polymer plastic runners.

3. All casing insulators shall be designed by the manufacturer for application given the particular carrier pipe O.D. and casing pipe I.D.

4. All bolts and bands shall be Type 304 stainless steel.

5. Spacing between the casing insulators shall be per the manufacturers recommendations except that there shall be at least 4 casing insulators per pipe section, one 12" from each joint and two centered in between.

6. Both ends of the casing between the casing and carrier pipe must be sealed watertight using an end seal selected from the Potable Water Material Guidelines. Bands shall be Type 304 stainless steel. Casing end seal shall be 1/4-inch thick styrene butadiene rubber.

7. All steel casing pipe joints shall be welded full circumference.

8. Materials shall be selected from the Potable Water Materials Guidelines.

9. HDPE casing may be used if it meets adequate strength for geotechnical conditions and with written approval from GSWC.

CASING SCHEDULE

<table>
<thead>
<tr>
<th>NOMINAL PIPE SIZE</th>
<th>NOMINAL CASING SIZE</th>
<th>MINIMUM WALL THICKNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>8&quot;</td>
<td>16&quot; I.D.</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>12&quot;</td>
<td>20&quot; I.D.</td>
<td>5/16&quot;</td>
</tr>
<tr>
<td>16&quot;</td>
<td>30&quot; I.D.</td>
<td>3/8&quot;</td>
</tr>
<tr>
<td>18&quot;</td>
<td>32&quot; I.D.</td>
<td>3/8&quot;</td>
</tr>
<tr>
<td>20&quot;</td>
<td>36&quot; I.D.</td>
<td>3/8&quot;</td>
</tr>
<tr>
<td>24&quot;</td>
<td>42&quot; I.D.</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>30&quot;</td>
<td>48&quot; I.D.</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>36&quot;</td>
<td>56&quot; I.D.</td>
<td>5/8&quot;</td>
</tr>
<tr>
<td>42&quot;</td>
<td>60&quot; I.D.</td>
<td>3/4&quot;</td>
</tr>
</tbody>
</table>

STANDARD DWG. NO. P-22
NOTES:
1. Tapping sleeve to be stainless steel per Potable Water Materials Guidelines.
2. Tapping sleeve and valve are to be completely wrapped with 8 mil. polyethylene encasement.
3. After installation and before hot tap is complete, the tapping sleeve shall be tested at
   system pressure, for a minimum of 15 minutes with no visible leakage.
4. Tapping sleeve shall have a full length and width gasket. O-Ring gaskets are not acceptable.
5. Diameter of the hot tap shall not exceed one size smaller of the main line diameter.
6. Tapping valve shall have a flange insulation kit between ductile iron valve and stainless steel
   tapping sleeve.

<table>
<thead>
<tr>
<th>EXISTING WATER MAIN SIZE (INCHES)</th>
<th>TAPPING PIPE SIZE (INCHES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4  6  8  10  12  14  16  18  20  24</td>
</tr>
<tr>
<td>6</td>
<td>6  15  X</td>
</tr>
<tr>
<td>8</td>
<td>8  15  15  X</td>
</tr>
<tr>
<td>10</td>
<td>10  15  15  20  X</td>
</tr>
<tr>
<td>12</td>
<td>12  15  15  20  20  20  X</td>
</tr>
<tr>
<td>14</td>
<td>14  15  15  20  20  24  X</td>
</tr>
<tr>
<td>16</td>
<td>16  16  16  20  20  24  24  X</td>
</tr>
<tr>
<td>18</td>
<td>18  16  16  20  20  24  24  32  X</td>
</tr>
<tr>
<td>20</td>
<td>20  16  16  20  20  24  24  32  36  X</td>
</tr>
<tr>
<td>24</td>
<td>24  16  16  20  20  24  24  32  36  40</td>
</tr>
</tbody>
</table>

* L = LENGTH OF TAPPING SLEEVE (INCHES)
NOTES:
1. Cut-in tee may use F.E.xF.E. or F.E.xM.J. as called out on the drawings.
2. Use pipe material similar to existing mainline (PVC pipe shall be 3' min. length).

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F.E.xF.E. (or F.E.xM.J.) gate valve per Potable Water Material Guidelines.</td>
</tr>
<tr>
<td>2</td>
<td>D.I.P. F.E.xP.E. per Potable Water Material Guidelines.</td>
</tr>
<tr>
<td>3</td>
<td>F.E.xF.E. tee per Potable Water Material Guidelines.</td>
</tr>
<tr>
<td>4</td>
<td>Flexible coupling per Potable Water Material Guidelines. For same size O.D. use Ductile Iron M.J. sleeve.</td>
</tr>
</tbody>
</table>

SEE GSWC STD. DWG. NO. P-18 FOR THRUST BLOCK REQUIREMENTS (SIMILAR TO CONDITION A)
NEW SERVICE INSTALLATION NOTES:

1. Meter box placement shall be per GSWC Std. Dwg. No. P-28 and/or as shown on plans. No meters shall be installed beyond limits of public right of way without easements, unless otherwise indicated on plans.

2. 12” minimum spacing between service taps, except on ACP and PVC mains where 24” minimum spacing shall be provided.

3. For HDPE service lines snake the service line in the trench to provide enough slack to allow at least one foot of thermal contraction per 100 feet of length.

4. No joints permitted in service lines unless an elbow is used for the 2” water service connection.

5. All new services shall be installed using service saddles.

6. For ¾” x ¾” meter, use an A24 adapter.

7. For ¾” x ¾” meter, use an A34 adapter.

8. For a 1” angle meter valve, 1” copper pack joint x ¾” meter nut may be utilized when specified on construction plans.

9. Services shall be installed a minimum of 10 feet from all sewer laterals and proposed street tree or street light locations.

10. In areas with corrosive soils use HDPE service lines.

11. Use silver solder (lead free) for all copper service work.

12. Applicant to install backflow prevention assembly per requirements of GSWC’s Cross—Connection Control Policy on all services as called for on the plans.

REPLACEMENT HOUSELINE NOTES:

1. Minimum size shall be no less than 1 inch.

2. If the existing houseline is copper, it will be replaced with same size copper. If the existing houseline is standard galvanized or plastic, it will be replaced with PVC SCH 80 unless the local building code specifies other material.

3. There is to be no PVC above grade. Above grade pipe shall match customer’s existing material. For bidding purposes contractor shall bid copper pipe with dielectric couplings.

4. A gate valve will be installed on new houselines that bypasses an existing valve.

5. Depth of houseline shall meet the requirements of the local plumbing code.

6. Reconnect the houseline no closer than 14 feet to the house. Cap the original houseline at the location of the original meter, unless otherwise noted. Flush original line in both directions until clear before installing cap.

7. Contractor will supply a list of materials used for each houseline and an as—built drawing of houseline installation.

8. Contractor shall restore impacted areas to equal or better than condition prior to performing work.
NOTES:

1. No water meter box shall be installed in driveway or sidewalk unless shown on the plans. Meter boxes shall be set to eliminate water runoff into the box.

2. No service closer than 24 inches to pipe bell.

3. Water meters in Wright Wood shall be installed at a minimum depth of 30 inches below grade. Use 2 stacked water meter boxes over meter.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>EACH</th>
<th>DESCRIPTION</th>
<th>SPECIFICATION</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Service saddle</td>
<td>Strap to be S.S.</td>
<td>See Potable Water Material Guidelines</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1&quot; bronze ball valve corp. stop</td>
<td>I.P. x C.T.S. compression</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>Copper tubing or HDPE</td>
<td>1&quot; Type K, soft</td>
<td>One piece only, no splices</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1&quot; angle meter stop (ball valve)</td>
<td>1&quot; C.T.S. compression x meter lock wing w/ 1/8&quot; thick cloth inserted in gasket</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>Water meter</td>
<td>5/8&quot;, 3/4&quot; or 1&quot;</td>
<td>Supplied &amp; installed by GSWC</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>Water meter box</td>
<td>12&quot;x20&quot; meter box</td>
<td>See Potable Water Material Guidelines</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>Bronze ball valve</td>
<td>Supplied &amp; installed by GSWC 1&quot; I.P. x C.T.S. compression</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>Water meter box pad</td>
<td>14&quot;x24&quot;x6&quot;, 3/4&quot; crushed rock</td>
<td>Pad for meter and box</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>Trench with sand envelope</td>
<td>Imported with SE &gt; 30</td>
<td>12&quot; min. &amp; 24&quot; max. trench width</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>Meter adaptor</td>
<td>Meter nut x 1&quot; I.P.S.</td>
<td></td>
</tr>
</tbody>
</table>
NOTES:

1. No water meter boxes shall be installed in driveways or sidewalks unless shown on the plans.

2. No services closer than 24" to pipe bell.

3. Water meters in Wright Wood shall be installed at a minimum depth of 30" below grade. Use 2 stacked water meter boxes over meter.

*Flattening copper pipe to make the radius is not allowed.

<table>
<thead>
<tr>
<th>ITEM EACH</th>
<th>DESCRIPTION</th>
<th>SPECIFICATION</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Service saddle</td>
<td>Strap to be S.S.</td>
<td>See Potable Water Material Guidelines</td>
</tr>
<tr>
<td>2</td>
<td>2&quot; bronze ball valve corp. stop</td>
<td>2&quot; I.P. x C.T.S. compression</td>
<td>See Potable Water Material Guidelines</td>
</tr>
<tr>
<td>3</td>
<td>Copper tubing or HDPE</td>
<td>2&quot; Type K, soft</td>
<td>One piece only, no bends, unless elbow is used. Elbow joints to be soldered.</td>
</tr>
<tr>
<td>4</td>
<td>Elbow (optional)</td>
<td>2&quot; C.T.S.</td>
<td>See Potable Water Material Guidelines</td>
</tr>
<tr>
<td>5</td>
<td>Angle meter stop (ball valve)</td>
<td>2&quot; C.T.S. compression x meter lock wing w/ 1/8&quot; thick cloth inserted in gasket</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Water meter</td>
<td>2&quot; fl supplied &amp; furnished by GSWC</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Bronze water meter flange</td>
<td>2&quot; F.I.P. threads w/ 1/8&quot; thk cloth insert drop in gasket</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Brass nipple</td>
<td>2&quot; brass close nipple, M.I.P. x M.I.P.</td>
<td>Supplied &amp; installed by GSWC</td>
</tr>
<tr>
<td>9</td>
<td>Bronze ball valve</td>
<td>2&quot; F.I.P. x F.I.P.</td>
<td>Supplied &amp; installed by GSWC</td>
</tr>
<tr>
<td>10</td>
<td>Water meter box</td>
<td>17&quot;x30&quot; meter box</td>
<td>See Potable Water Material Guidelines</td>
</tr>
<tr>
<td>11</td>
<td>Water meter box pad</td>
<td>20&quot;x34&quot;x6&quot;, 3/4&quot; crushed rock</td>
<td>Pad for meter box</td>
</tr>
<tr>
<td>12</td>
<td>Trench with sand envelope</td>
<td>Imported with SE &gt; 30</td>
<td>12&quot; min. &amp; 24&quot; max. trench width</td>
</tr>
<tr>
<td>13</td>
<td>Drop in gasket</td>
<td>1/8&quot; thk cloth inserted gasket</td>
<td>At both meter flanges</td>
</tr>
</tbody>
</table>
NOTES:
1. Meter box size for 1" service will be 12"x20".
2. Meter box size for 2" service will be 17"x30".
3. For Meter Box Details see GSWC Std. Dwg. No. P–26 and P–27.
4. Location of meter box shall be called out on the plans by referencing this standard drawing.
NOTE:

1. Two-way feed shall be provided where six or more services are to be installed. A maximum of fifteen services may be installed on one battery.
PLAN

VAULT DESCRIPTION

CONCRETE VAULT

EPoxy LINEd AND PAINTED STEEL PIPE

D.I.P. OR P.V.C. PIPE

SEE NOTE 4

NOTE:

1. Bypass piping not required for irrigation services.

2. Ultra sonic meter shall be of a type approved by N.S.F., F.M. and A.W.A.

3. Ultra sonic meter body shall be Type 316 stainless steel or epoxy coated ductile iron.


5. All pipes on both sides of vault shall be fully restrained.

ITEM

1. Non-traffic bearing 20K rated vault located behind curb and/or parkway, with open bottom. Lid shall be lockable, torsion spring assisted aluminum design for 10K loading. Use 20K rated vault and lid in traffic locations. See Potable Water Materials Guidelines for acceptable manufacturers and GSWC Std. Dwg. No. P-35 for vault details.


3. Bypass piping up to 2" shall be Type K copper with soldered joints or wrapped and epoxy lined Sch. 80 steel for 3" or larger bypass pipe.

4. 3" meter will usually be fed by a 4" pipe. Install increaser/reducer on pipe outside of vault.

5. Victaulic coupling shall be AWWA approved Style 31.


7. 2" service saddle with ball curb stops (one for meter testing).

8. All dissimilar metals shall be insulated from each other by insulated flanges or bushings.

VAULT DESCRIPTION

<table>
<thead>
<tr>
<th>PIPE/METER</th>
<th>A (METER ASSEMBLY)</th>
<th>B (METER)</th>
<th>VAULT SIZE</th>
<th>FLOW RANGE (GPM)</th>
<th>BYPASS PIPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3&quot;</td>
<td>5'</td>
<td>12&quot;</td>
<td>4&quot;x6&quot;</td>
<td>1-500</td>
<td>2&quot;</td>
</tr>
<tr>
<td>4&quot;</td>
<td>7&quot;</td>
<td>14&quot;</td>
<td>4&quot;x8&quot;</td>
<td>1.2-1,000</td>
<td>2&quot;</td>
</tr>
</tbody>
</table>

APPROVED BY:
GSWC STANDARDS COMMITTEE

Golden State Water Company
A Subsidiary of American States Water Company

TITLE:
LARGE METER WITH BYPASS
(3-INCH TO 4-INCH METER)

SCALE: NONE
DATE: 01/16
REV: 1.0
STANDARD DWG NO.: P-30A
ITEM | DESCRIPTION
--- | ---
1 | Non-traffic bearing 20k rated vault located behind curb and/or parkway, with open bottom. Lid shall be lockable, torsion spring assisted aluminum design for 10K loading. Use 20K rated vault and lid in traffic locations. See Potable Water Materials Guidelines for acceptable manufacturers and GSWC Std. Dwg. No. P–36 for vault details.
2 | Alternate hatch cover: 3 piece steel bolt down traffic/parkway cover. See GSWC Std. Dwg. No. P–36.
3 | Bypass piping shall be wrapped and epoxy lined Sch. 80 steel for 3" or larger bypass pipe.
4 | Bypass shut off valve shall be epoxy lined gate valve for 3" or larger bypass pipe.
5 | 3" meter will usually be fed by a 4" pipe. Install increaser/reducer on pipe outside of vault between valves and vault. Move valves as needed.
6 | Victaulic coupling shall be AWWA approved Style 31.
8 | Service saddle with ball curb stop for meter testing.
9 | All dissimilar metals shall be insulated from each other by insulated flanges or bushings.

### VAULT DESCRIPTION

<table>
<thead>
<tr>
<th>PIPE/METER SIZE</th>
<th>A (UPSTREAM SPOOL)</th>
<th>B (METER)</th>
<th>VAULT SIZE</th>
<th>FLOW RANGE (GPM)</th>
<th>BYPASS PIPE</th>
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<tbody>
<tr>
<td>6&quot;</td>
<td>12&quot;</td>
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<td>4&quot;x4&quot;</td>
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<td>8&quot;</td>
<td>16&quot;</td>
<td>20&quot;</td>
<td>4&quot;x5&quot;</td>
<td>5–2,800</td>
<td>4&quot;</td>
</tr>
<tr>
<td>10&quot;</td>
<td>20&quot;</td>
<td>18&quot;</td>
<td>4&quot;x5&quot;</td>
<td>14–5,500</td>
<td>6&quot;</td>
</tr>
</tbody>
</table>

### NOTE:

1. Bypass piping not required for irrigation services.
2. Ultra sonic meter shall be of a type approve by N.S.F., F.M. and A.W.W.A.
3. Ultra sonic meter body shall be Type 316 stainless steel or epoxy coated ductile iron.
5. All pipes on both sides of vault shall be fully restrained.
NOTES:
1. The following valve box types shall be used unless otherwise noted:
   Type 1 – Northern & Coastal Districts OR concrete surfaced streets.
   Type 3 – All other districts.
2. Final rim elevation to be \( \frac{3}{8} \)" to \( \frac{1}{4} \)" below final street grade.
3. More stringent installation requirements may be imposed by the entity having the jurisdiction over the
   valve box installation location.
4. A valve extension stem shall be provided where the depth to the operating nut exceeds 4 feet.
5. Contractor to form 18 inch diameter concrete collar in unimproved areas with sonotube and remove
   prior to backfill installation (typ).
7. For paving around valves not in the pavement, see GSWC Std. Dwg. No. C–12.
8. Valve box lid painted blue per Section 10 of the GSWC Technical Specifications.
NOTES:

1. The following valve box types shall be used unless otherwise noted:
   - Type 1 — Northern & Coastal Districts OR concrete surfaced streets.
   - Type 3 — All other districts

2. Final rim elevation to be \( \frac{3}{8} \)" to \( \frac{3}{4} \)" below final street grade.

3. More stringent installation requirements may be imposed by the entity having the jurisdiction over the valve box installation location.

4. A valve extension stem shall be provided where the depth to the operating nut exceeds 4 feet.

5. Contractor to form 18 inch diameter concrete collar in unimproved areas with sonotube and remove sonotube prior to backfill installation (typ).


7. For paving around valves not in the pavement, see GSWC Std. Dwg. No. C–12.

8. Valve box lid painted blue per Section 10 of the GSWC Technical Specifications.
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<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>Can and cover assembly per GSWC Std. Dwg. No. P–31 or P–32, painted red</td>
</tr>
<tr>
<td>②</td>
<td>Valve can</td>
</tr>
<tr>
<td>③</td>
<td>4&quot;x4&quot; redwood post</td>
</tr>
<tr>
<td>④</td>
<td>Route initials &quot;GSWC–NC&quot; for (normally closed) on all sides in 1½&quot; high letters, ½&quot; deep, clearly legible or security attach 1½&quot; high brass label on all four sides engraved with &quot;GSWC–NC&quot;</td>
</tr>
</tbody>
</table>
**NOTES:**

1. Contractor shall clearly and permanently label the pressure zones on the inlet and outlet pipes, using 2” min. high numerals and letters.
2. Materials shall be selected from the Potable Water Materials Guidelines.
3. Finished surface (FS) elevations shall be shown on the plans.
4. Piping shall be painted “Desert Sand” for potable water.
5. (D1) = Large Diameter. (D2) = Small Diameter.

---

**PLAN**

**SELECTION TABLE**

<table>
<thead>
<tr>
<th>VALVE SIZE (INCHES)</th>
<th>MIN. FLOW RATE (GPM)</th>
<th>MAX. FLOW RATE (GPM)</th>
<th>DIA. BONNET (INCHES)</th>
<th>REQUIRED CLEAR SPACE (INCHES)</th>
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<td>11,000</td>
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<td>*60</td>
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* Pressure reducer valves larger than 12” may required a larger vault. Verify dimensions needed.

**ITEM**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>1</td>
<td>(D1) Pressure reducer valve, FE</td>
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<tr>
<td>2</td>
<td>(D2) Pressure reducer valve, FE</td>
</tr>
<tr>
<td>3</td>
<td>Service saddle with 1” ball valve for pressure gauges (4 reg’d)</td>
</tr>
<tr>
<td>4</td>
<td>(D1) Gate valve, resilient wedge type (2 required)</td>
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<tr>
<td>5</td>
<td>(D2) Gate valve, resilient wedge type (2 required)</td>
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<td>6</td>
<td>(D1) FE x grooved D.I. spool (length as required)</td>
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<td>(D1) D.I. spool, FE</td>
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<td>D.I. spool, FE (length as required)</td>
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<tr>
<td>9</td>
<td>D.I. spool, FEP (length as required)</td>
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<td>10</td>
<td>(D1) Victaulic coupling, grooved</td>
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<tr>
<td>11</td>
<td>(D2) Victaulic coupling, grooved</td>
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<tr>
<td>12</td>
<td>Pipe support (2 required)</td>
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<tr>
<td>13</td>
<td>90° elbow (2 required)</td>
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<td>14</td>
<td>Required clear space for D1 valve</td>
</tr>
<tr>
<td>15</td>
<td>Required clear space for D2 valve</td>
</tr>
<tr>
<td>16</td>
<td>6’x6’ concrete vault (shown) with H=20 rated spring assisted hinged lid (See GSWC Std. Dwg. No. P-36). Vault size to be determined based on valve size.</td>
</tr>
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### Selection Table

<table>
<thead>
<tr>
<th>Valve Size (Inches)</th>
<th>Min. Flow Rate (GPM)</th>
<th>Max. Flow Rate (GPM)</th>
<th>Dia. Bonnet (Inches)</th>
<th>Required Clear Space (Inches)</th>
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<td>4</td>
<td>800</td>
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<td>95</td>
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<td>60</td>
</tr>
</tbody>
</table>

* Pressure reducer valves larger than 12" may required a larger vault. Verify dimensions needed.

### Notes:

1. Contractor shall clearly and permanently label the pressure zones on the inlet and outlet pipes. Use 2" min. high numerals and letters.

2. Materials shall be selected from the Potable Water Materials Guidelines.

3. Finished surface (FS) elevations shall be shown on the plans.

4. Piping shall be painted "Desert Sand" for potable water.

5. (D1) = Large Diameter. (D2) = Small Diameter.
NOTES:

1. The backflow preventer assembly shall consist of an approved Reduced Pressure or Double Check Valve in accordance with the GSWC Water Quality Department requirements. The assemblies shall be suitable for supply pressures.

2. A backflow preventer assembly for a fire service shall consist of an approved Reduced Pressure Principle Detector Assembly (RPDA) or Double Check Valve Detector Assembly (DCDA) in accordance with the GSWC water quality department requirements. The assemblies shall be suitable for supply pressure.

3. It is recommended that an angle style pressure reducing valve be installed on the upstream line of the backflow preventer when pressure in excess of 80 P.S.I. or more is supplied per section 608.2 of the Uniform Plumbing Code.

4. It is recommended that wye strainers be installed on the upstream side of the backflow preventer body. If required, a pressure regulator with a serviceable screen can be substituted for the wye strainer.

5. Location and installation shall be per plan as submitted to and accepted by GSWC.

6. It is recommended that all assemblies 21/2" and larger to be installed shall be equipped with resilient wedge gate valves.

7. Locate the assembly within 5 feet of customer service valve as possible. Other locations must be approved prior to installation.

8. Assemblies shall not be located in areas subject to flooding.

9. Only security enclosures providing adequate clearances and full view of assemblies are permitted.

10. Landscape or construction around assembly shall permit an unobstructed view of the assembly from the street.

11. Final inspection and acceptance test shall be provided to GSWC by the customer using a certified backflow tester.

12. No connections or tees are permitted between meter and backflow preventer.

13. It is recommended that sizes 3" and larger have additional pipe support.

14. It is recommended that the backflow assembly be the same size or one size larger than the meter.

15. Materials may be selected from the GSWC Potable Water Materials Guidelines.
NOTES:

1. Vaults shall be designed for AASHTO 20K loads with open bottom, hex-headed bolts and lockable torsion spring assisted aluminum lids.

2. When total depth is greater than 4 feet an attached aluminum ladder shall be provided with a Ladder-up Safety Pole.

3. Vaults for meter installation shall be equipped with a meter reading lid centered over the meter if called for on the plans.

4. Joints between vault sections shall have a butyl rubber sealant installed.

5. Install 6" thick x12" wide concrete base under all vault walls.

6. Bottom of vault shall be filled with 8" thick minimum layer of compacted ¾" crushed rock compacted or Class 2 AB.

NOTES:
1. Opening thru vault wall shall be sized to accommodate pipe and rubber sealing device.

2. Buried application is shown. Where outside face of structure is above grade, fill the outside 2" of the sleeve with non–shrink grout.

NOTES:

1. Gasket shall be Type 'E' full face phenolic with O-Ring.

2. Sleeve shall be G10 Class.

3. Washers shall be G10 Class.
NOTES:

1. Pipe and fittings shall be standard weight steel, fusion bonded epoxy lined and coated per AWWA C550. All inverts shall be shop fabricated with exception of field installation of weld-on-flanges. Units shall provide 12" extra vertical length.

2. Service saddle shall be installed on the high points of the offset for the installation of combination air release vacuum relief valve, as specified on the plan. Service saddle shall be 1" on 8" and smaller mains, and 2" on larger existing mains.

3. Sand or slurry mix shall be used as backfill in accordance with local permit agency requirements.

4. If utility conduit is non-potable, minimum distance shall comply with DDW Waterworks Standards and Std. Dwg. No. P-2.

5. Trench backfill and bedding shall be as shown on Standard Drawing No. P-3.
NOTES:

1. The concrete restraining blocks shall be a minimum of 24” high and 12” thick. The top of the block shall be no more than 6” above top of pipe.

2. All pipe joints at 90’ bends shall be mechanical joint with Megalug or retaining gland. Flanged joints may be used where conditions warrant.

3. Installation shall be encased in a polyethylene wrapper per AWWA Standard C105.

4. Service saddle and combination air release vacuum relief valve shall be installed on the high points of the offset. Service saddle shall be 1” on 8” and smaller existing mains and 2” on larger existing mains.

5. If bottom spool piece exceeds 18 feet, connect pipe sections with GSWC approved joint restraints.

6. If utility conduit is non–potable, minimum dimension shall comply with DDW Waterworks Standards and Std. Dwg. P–2.

7. Trench backfill and bedding shall be as shown on Standard Drawing No. P–3.
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5. If bottom spool piece exceeds 18 feet, connect pipe sections with GSWC approved joint restraints.

6. If utility conduit is non-potable, minimum dimension shall comply with DDW Waterworks Standards and Std. Dwg. P-2.

7. Trench backfill and bedding shall be as shown on Std. Dwg. No. P-3.
NOTES:

1. All anchor rods are to be covered with 80 mils of bitumastic compound.

2. The anchor block shall be keyed no less than 12 inches into undisturbed soil of the trench wall and no less than 6 inches into the trench bottom.

3. Anchor block required only when valve is not flanged to a tee or cross.

4. Concrete shall be 2500 psi minimum with 3-inches minimum cover rebar. No concrete shall be poured on valve or joint.

5. Wrap exterior of valve, actuator and rebar with 8 mil polyethylene sheeting and tape.
NOTES:

1. This is to be used only where a storm drain connection cannot be made.

2. If existing curb is cracked or has an expansion joint within 3 feet of the proposed saw cut, extend limits of cut to that point.

3. An approved backflow prevention method shall be installed upstream to curb drain box.
NOTES:

1. Pipe supports shall be painted and coated in accordance with the GSWC standard paint specifications. Color to match piping.

2. All threaded areas shall be coated with "never-seize" or other equivalent anti-rust lubricant.

3. Support to be installed under all valves and at 10 foot maximum spacing.

4. Steel plate can be attached to a concrete pad if necessary using wedge type anchor bolts designed for use in concrete. Anchor bolts shall be be installed at least 2" into concrete and be ½" diameter x 3" long to allow for a washer and nut on the end. Bolt, washer and nut shall be galvanized for corrosion protection.
MORTAR CAP

#5 (#16M) CONT. AT EACH BOND BEAM TYP. SEE NOTE 14

TYPE 1

#5 (#16M) CONT. AT EACH BOND BEAM TYP. SEE NOTE 14

DETAILS FOR DOUBLE REINFORCEMENT SEE REINFORCING SCHEDULES FOR REQD USE

TYPE 2

#5 (#16M) CONT. AT EACH BOND BEAM TYP. SEE NOTE 14

TYPE 3

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1993

REINFORCED CONCRETE BLOCK WALL

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 601-3

APPROVED BY:
GSWC STANDARDS COMMITTEE

Golden State Water Company
A Subsidiary of American States Water Company

EDC MANAGER 01/16

DATE

SCALE: DATE: REV: STANDARD DWG NO.
NONE 01/16 1.0 C-3A
DETAILS FOR SINGLE REINFORCEMENT
SEE REINFORCING SCHEDULES FOR ALLOWED USE
SEE SHEET 1 FOR OTHER DIMENSIONS AND DETAILS
**LATERAL LOAD = 15 PSF (720 Pa)**

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**LATERAL LOAD = 20 PSF (960 Pa)**

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**LATERAL LOAD = 25 PSF (1200 Pa)**

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<td>#5 @ 32&quot;*</td>
<td>#5 @ 32&quot;*</td>
</tr>
<tr>
<td></td>
<td>(150 mm)</td>
<td>(300 mm)</td>
<td>(600 mm)</td>
<td>(750 mm)</td>
<td>(1125 mm)</td>
<td>(750 mm)</td>
<td>(#3M@800)</td>
<td>(#3M@800)</td>
<td>(#3M@800)</td>
</tr>
<tr>
<td>8'-0&quot;</td>
<td>8&quot;</td>
<td>12&quot;</td>
<td>3'-9&quot;</td>
<td>4'-9&quot;</td>
<td>4'-9&quot;</td>
<td>30&quot;</td>
<td>#4 @ 32&quot;EF</td>
<td>#4 @ 32&quot;EF</td>
<td>#4 @ 32&quot;EF</td>
</tr>
<tr>
<td></td>
<td>(200 mm)</td>
<td>(300 mm)</td>
<td>(1125 mm)</td>
<td>(1200 mm)</td>
<td>(1205 mm)</td>
<td>(750 mm)</td>
<td>(#3M@600EF)</td>
<td>(#3M@600EF)</td>
<td>(#3M@600EF)</td>
</tr>
<tr>
<td>10'-0&quot;</td>
<td>8&quot;</td>
<td>12&quot;</td>
<td>4'-9&quot;</td>
<td>4'-9&quot;</td>
<td>5'-0&quot;</td>
<td>50&quot;</td>
<td>#5 @ 16&quot;EF</td>
<td>#5 @ 32&quot;EF</td>
<td>#5 @ 32&quot;EF</td>
</tr>
<tr>
<td></td>
<td>(200 mm)</td>
<td>(300 mm)</td>
<td>(1425 mm)</td>
<td>(1205 mm)</td>
<td>(1205 mm)</td>
<td>(1250 mm)</td>
<td>(#3M@1200EF)</td>
<td>(#3M@600EF)</td>
<td>(#3M@600EF)</td>
</tr>
</tbody>
</table>

**NOTE**

Single vertical reinforcing bars shall be centered in cell.
* For single a-bars in foundation, see Sheet 2.
Double rows of vertical reinforcing where indicated shall be placed at each face (EF).

---

**STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION**

**REINFORCED CONCRETE BLOCK WALL**

**APPROVED BY:**
GSWC STANDARDS COMMITTEE

**EDC MANAGER**
01/16

**Golden State Water Company**
A Subsidiary of American States Water Company

---

**STANDARD PLAN**

**601-3**

**SHEET 4 OF 6**
DESIGN CRITERIA:

MATERIALS DESIGN DATA:

REINFORCING STEEL .................................................. $f_y = 60$ KSI (400 MPa)

CONCRETE 28TH-DAY STRENGTH:
FOOTING ............................................................... $f' c = 2,500$ PSI (17 MPa)

CONCRETE MASONRY:
PARTIALLY GRUOTED ................................................ $f' m = 1,500$ PSI (10 MPa)

DESIGN CODE: ................................................................ GOVERNING BUILDING CODE

DESIGN METHOD:

CONCRETE ................................................................ ULTIMATE STRENGTH METHOD
CONCRETE MASONRY ........................................ WORKING STRESS METHOD

FOUNDATION:

ALLOWABLE SOIL BEARING PRESSURE .................. 1,000 PSF (48 kPa)
ALLOWABLE LATERAL SOIL BEARING PRESSURE .... 100 PSF / FT OF DEPTH
(157 kPa / m OF DEPTH)
LATERAL SLIDING RESISTANCE AT CONTACT AREA........... 130 PSF (5.2 kPa)
BUT NOT TO EXCEED 0.40 X DL
SOIL DENSITY .............................................................. 110 PCF (1760 kg/m^3)
FACTORS OF SAFETY FOR SPREAD FOOTING (BASED ON SERVICE LOAD CONDITIONS):
OVERTURNING ............................................................. 1.75 MINIMUM
SLIDING ................................................................. 1.5 MINIMUM

1/3 INCREASE IS ALLOWED FOR SHORT TERM LOADS.
GENERAL NOTES:
1. CONSULT WITH LOCAL GOVERNING AGENCY FOR DETERMINATION OF LATERAL LOAD AND WALL TYPE LISTED IN TABLES, FOR PROJECT-SPECIFIC USE.
2. DISTANCE OF THE FOOTING FROM DESCENDING SLOPE SHALL BE PER LATEST GOVERNING BUILDING CODE OR PER AGENCY REQUIREMENTS.
3. SPECIAL INSPECTION IS NOT REQUIRED FOR WALLS.
4. GROUND LINE TO BE AT THE SAME ELEVATION ON BOTH SIDES OF THE WALL. WALL SHALL NOT BE USED TO RETAIN EARTH.
5. USE TABULAR INFORMATION FOR THE NEXT HIGHER H FOR INTERMEDIATE WALL HEIGHTS THAT ARE BETWEEN THE H'S GIVEN.
6. CONCRETE SHALL BE 500-C-2500 (295-C-17) PER SSPWC 201-1.1.2.
7. REINFORCING SHALL BE LAPPED A MINIMUM 48 BAR DIA. GRADE 60 UNLESS NOTED OTHERWISE PER SSPWC SECTION 201-2, 303-4.1.3, JOINT REINFORCING WIRE: ASTM A82.
8. ALL REINFORCED CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH SSPWC 303.
9. FOR TYPE OF BLOCKS, BOND PATTERN AND JOINT FINISH, SEE PROJECT PLANS.
10. ALL MASONRY CONSTRUCTION TO BE IN ACCORDANCE WITH SSPWC 303-4.
11. HOLLOW MASONRY UNITS: ASTM C-90, TYPE I, NORMAL WEIGHT UNITS.
   MORTAR ...
   PORTLAND CEMENT = LIME = SAND RATIO, 1800 PSI (13 MPa) PER SSPWC 202-2.2.1.
   GROUT ... PORTLAND CEMENT = SAND = PEA GRAVEL RATIO, 2000 PSI (14 MPa) PER SSPWC 202-2.2.2.
12. PROVIDE FULL MORTAR BED AT THE BOTTOM OF THE FIRST COURSE AND OMIT MORTAR BETWEEN VERTICAL JOINTS OF LOWEST EXPOSED COURSE.
13. WHEN BLOCKS ARE LAY IN STACKED BOND, CONTINUOUS HORIZONTAL JOINT REINFORCEMENT SPACED AT 4'-0" (1200 mm) OC SHALL BE PROVIDED IN ADDITION TO THE BOND BEAM REINFORCEMENT PER SSPWC 303-4.1.2, LOCATE REINFORCEMENT IN JOINTS THAT ARE APPROXIMATE MIDPOINT BETWEEN BOND BEAMS.
14. BOND BEAMS SHALL BE PLACED AT TOP OF WALL AND SUBSEQUENTLY SPACED NOT TO EXCEED 4'-0" (1200 mm) OC BELOW.
15. ONLY CELLS WITH REINFORCING BARS SHALL BE GROUTED PER SSPWC 303-4.1.3.
16. HORIZONTAL JOINTS SHALL BE TOOLED CONCAVE OR WEATHERED. VERTICAL JOINTS SHALL BE TOOLED CONCAVE OR RAKED. WEATHERED AND RAKED JOINTS ARE NOT PERMITTED FOR SLUMPED BLOCKS.

REINFORCED CONCRETE BLOCK WALL

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

| APPROVED BY: GSWC STANDARDS COMMITTEE |
| Golden State Water Company |
| A Subsidiary of American States Water Company |
| EDC MANAGER 01/16 |
| DATE |
| TITLE: REINFORCED CONCRETE BLOCK WALL |
| SCALE: NONE |
| DATE: 01/16 |
| REV: 1.0 |
| STANDARD DWG NO: C-3F |
NOTES:

1. Specific gate design and detail shall be submitted as a shop drawing.

2. Curved tines can be used if shown on the plans.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>ITEM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gate posts, 4&quot; square, 3/16&quot; wall</td>
<td>10</td>
<td>Track</td>
</tr>
<tr>
<td>2</td>
<td>Gate frame, 2&quot; square, 14 GA.</td>
<td>11</td>
<td>Trolley</td>
</tr>
<tr>
<td>3</td>
<td>Track</td>
<td>12</td>
<td>Fence line</td>
</tr>
<tr>
<td>4</td>
<td>Carriage post, 4&quot; square, 3/16&quot; wall</td>
<td>13</td>
<td>Perimeter fence/wall</td>
</tr>
<tr>
<td>5</td>
<td>Guide Rollers</td>
<td>14</td>
<td>Steel tube fence</td>
</tr>
<tr>
<td>6</td>
<td>1/4&quot;x3/4&quot; truss rod</td>
<td>15</td>
<td>Padlock hasps</td>
</tr>
<tr>
<td>7</td>
<td>1-1/8&quot; square, 16 GA. picket</td>
<td>16</td>
<td>Drop latch</td>
</tr>
<tr>
<td>8</td>
<td>Rollers</td>
<td>17</td>
<td>Concrete footing</td>
</tr>
<tr>
<td>9</td>
<td>Gate, width will vary depending on site</td>
<td>18</td>
<td>Hinge</td>
</tr>
</tbody>
</table>

TYPICAL FENCE SECTION

MAIN GATE

ELEVATION

PLAN

ROLLING CANTILEVER VEHICLE GATE

SECTION

GSWC PROPERTY

Golden State Water Company
A Subsidiary of American States Water Company

APPROVED BY:
GSWC STANDARDS COMMITTEE

EDC MANAGER

STEEL TUBE FENCE AND GATE

C-4
ITEM | DESCRIPTION
--- | ---
1 | 3" A.C. min. thickness.
2 | 6" Class 2 A.B. min. thickness.
3 | Concrete Alley Gutter per GSWC Std. Dwg. No. C-6.
4 | Finished surface.
5 | Finished surface elevation (varies) as shown on the plans.
6 | Top of ringwall or building foundation per plans.
7 | Tank shell or building wall.
8 | Cut slope or fill slope per geotech recommendations. Soil compacted to 90% relative density.
NOTES:
1. Total vertical distance from top of A.C. to flow line of Alley Gutter is 0.20' which includes the 2" depression of the Alley Gutter plus 3/8" A.C. lip.
NOTES:

1. Type B and F curb and gutter shall have AC pavement \(\frac{3}{8}\)" above lip for proper drainage.

2. Type C curb and gutter shall have AC pavement \(\frac{3}{8}\)" below lip for proper drainage.
NOTES:

1. Sign panels shall be of sheet aluminum material 0.08-inch thick. Thickness, finish and structural integrity to conform to City, County and State standards and requirements.

2. Posts and skids shall be of treated/painted wood material. Dimensions, finish and structural integrity to conform to City, County and State standards and requirements.

3. Posts shall be either embedded into the ground with any needed support or anchoring or mounted on skids to meet City, County or State standards.

4. Signs shall be located within public right of way, and not interfere with the pedestrian or traffic flow.

5. Sign details — White background with reflective surface — Permanent lettering to be bold, block letters in GSWC dark blue.
NOTE:
LUBRIFICATE IN-GROUND PORTION OF THE PIPE TO PREVENT ADHESION TO THE SLEEVE

5" PIPE SLEEVE (1/4" MIN. WALL)

3" MIN. ABOVE FINISHED SURFACE

36" MIN.

BOLLARD TO BE EXTENDED MIN. 6" ABOVE HYDRANT HEAD

4" STEEL PIPE, SCH 40 FILLED W/CONCRETE

POSTS ENCASED IN CONCRETE, 18" DIA. PCC WITH f'c=2,500 PSI @ 28 DAYS

9" MIN. (TYP.)

NOTES:

1. Orientation of barricade may be changed according to field conditions.

2. Bollard coating color per local fire department requirements.
   
   A. in lieu of painting a protective polyethylene sleeve may be put over steel post colored to meet local fire department requirements.

3. Coating material shall be per company painting specifications for above grade steel piping.
   
   A. A polyethylene encased steel post (Sch.40 pipe) may be used instead of a painted post.

4. See Potable Water Material Guidelines for acceptable manufacturers.
MATERIALS:

1. Residential hydrant with (1) 4” and (1) 2 1/2” fire hose outlets. Non-residential hydrant with (2) 4” and (1) 2 1/2” fire hose outlets.

2. Construct 48”x36”x6” thick or 36”x36”x6” thick concrete pad reinforced with W.W.M. 1.6x1.6.

NOTES:

1. Each marker shall be placed as follows:
   a. Arterial streets, install marker one foot outside of centerline strip or
      median curb or left turn pocket line toward the side where fire hydrant
      is located.
   b. Local streets, install marker one foot outside of centerline (stripped or
      unmarked) toward the side where fire hydrant is located.

2. One marker to be placed on adjacent street when hydrant is on corner of
   an arterial/arterial intersection or a local/local intersection.

3. Two markers to be placed one on each street when hydrant is on corner
   of an arterial/local intersection.

☐ = BLUE PAVEMENT MARKER
☒ = FIRE HYDRANT
NOTE:

1. Slope will conform to governing agency road improvement standards and specifications, or meet existing conditions as directed by engineer. Pad shall be sloped away from valve lid.

2. Valves located in landscaped areas shall have a 2’x2’ concrete pad installed around each valve.

3. AC or concrete pad.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2”x6” redwood headers</td>
</tr>
<tr>
<td>2</td>
<td>2”x4”x18” stokes (3 per side) at 30” O.C.</td>
</tr>
<tr>
<td>3</td>
<td>Area to be paved</td>
</tr>
<tr>
<td>4</td>
<td>6” of 3/4” Class 2 A.B.</td>
</tr>
</tbody>
</table>
NOTES:

1. Waterline marker post shall be installed where called for on the plans or as directed by the engineer. Spacing shall be approximately 200’ between markers, curved alignments less than 800’ in length shall have a minimum of four markers to define the curve.

2. Waterline marker post shall be installed 12” to the south and west of the utility.

3. Marker shall incorporate 1” high lettering branded/burned into paddle. Lettering shall include GSWC along with the utility identified. The color of the paddle shall be blue.

4. Lettering shall be white.

5. On back of marker write: "Call GSWC at (800) 999-4033" and "Before digging in this area call 811".

Marking:

- Watermark
  - 1” Lettering
  - (see Note 3)

- Finished Grade
- 2’-0”
- 5’-6” to 6’-0”
- 3’-3/4”

Marker Post

- Pipeline Marker
- Valve Marker
POLE MOUNTED LIGHT

4" SQUARE 16' HIGH STEEL POLE WITH BRONZE POWDER COAT FINISH

WEATHER PROOF RECEPTACLE (GFI)
HAND HOLE
GALVANIZED ANCHOR BOLT PER MFGRS REQUIREMENTS (TYP 4)
¾" DIA. x 30" LONG
½" CHAMFER

FINISHED GRADE
#4 TIES AT 8" O.C.
1½" PVC CONDUIT FROM POWER SOURCE

BURNDY CAT. #GK1426 GROUND CONNECTION
#10 SOLID COPPER GROUNDING WIRE
¾" x 10' LONG COPPER GROUND ROD
4-#6 REBAR

POLE MOUNTED LIGHT
N.T.S.

SECTION
N.T.S.

NOTES:

1. Refer to civil/structural drawings for reinforcement detail.
SECTION A

EXISTING PAVED ROADWAY

MATCH EXISTING GRADE

SECTION B

TEMPORARY RUMBLE PAD FOR DIRT CONTROL TO BE REMOVED AFTER FINAL PAVING.

24 FEET (MIN.)

50 FEET MIN OR FOUR TIMES THE CIRCUMFERENCE OF THE LARGEST CONSTRUCTION VEHICLE TIRE WHICHEVER IS GREATER

10 FEET MIN OR AS REQUIRED TO ACCOMODATE ANTICIPATED TRAFFIC, WHICHEVER IS GREATER.

PLAN VIEW

N.T.S.

CRUSHED AGGREGATE GREATER THAN 3" (75 MM) BUT SMALLER THAN 6" (150 MM)

FILTER FABRIC

ORIGINAL GRADE

12" (30 MM) MIN

SECTION A

N.T.S.

CRUSHED AGGREGATE GREATER THAN 3" (75 MM) BUT SMALLER THAN 6" (150 MM)

CORRUGATED STEEL PLATES

ORIGINAL GRADE

FILTER FABRIC

12" (30 MM) MIN

SECTION B

N.T.S.
NOTE:
INSTALL FIBER ROLL ALONG A LEVEL CONTOUR

VERTICAL SPACING MEASURED ALONG THE FACE OF THE SLOPE IS 20'.

TYPICAL FIBER ROLL INSTALLATION
N.T.S.

ENTRENCHMENT DETAIL
N.T.S.
PIPE DIA. + 6" EACH SIDE

END ___" DRAIN PIPE, INSTALL HINGED VERTICAL GRATE TO COVER OPENING MOUNTED ON FACE OF HEADWALL

EXISTING GRADE

FRONT ELEVATION

2'-0"

12"

RIP-RAP

SIDE ELEVATION

3'-0"

6"

5'-0"

PLAN VIEW

3'-0"

6"

6"
NOTES:

1. Protective cage to be constructed of formed steel angle frame and expanded metal mesh welded together.

2. Protect steel from corrosion with a high grade powder coated finish similar in color to adjacent pipe.

3. Provide lifting handles and hasp-type lock system.

4. Cage configuration to be modified to match structure or pipe where it will be constructed.
NOTES:

1. In unpaved traffic areas, install a 6-ft square concrete pad (6-in thick) as shown in plan view.

2. In paved areas, manhole frame and cover shall be flush with finished surface.